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Effect of Guided Imagery on Maternal Fetal Attachment in Nulliparous Women with Unplanned Pregnancy

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ABSTRACT

Background & aim: Nulliparous women with unplanned pregnancy experience high levels of anxiety, which may adversely affect maternal-fetal attachment. Therefore, in this study, we aimed to determine the effect of guided imagery on maternal-fetal attachment in nulliparous women with unplanned pregnancy.

Methods: In this clinical trial, 67 nulliparous women with unplanned pregnancy were randomly divided into two groups of intervention (n=35) and control (n=32) in 2015. Data collection tools included a demographic form and London, DASS 21, and Cranley's maternal-fetal attachment questionnaires. In the intervention group, one session of guided imagery on maternal role was performed in 34th week of pregnancy in groups of four to seven. Afterwards, guided imagery CDs were given to mothers to be performed at home twice a week for two weeks; the control group only received the routine care. Maternal-fetal attachment was assessed before and two weeks after the intervention. To analyze the data, independent t-test, paired t-test, Chi-squared, Fisher's exact test, and Mann-Whitney U tests were run using SPSS version 21.

Results: Maternal mean age was 24.1±4.3 years, and most mothers (49.3%) had high school education. Mean score of maternal-fetal attachment was significantly different between the intervention (94.26±6.7) and control (90.22 ± 9.5) groups after the intervention (P=0.04). Also, there was a significant difference between mean score of maternal-fetal attachment at the beginning and end of the intervention in the intervention and control groups (5.86±7.2 vs. 1.72±3.2; P=0.004).

Conclusion: Guided imagery promoted maternal-fetal attachment in women with unplanned pregnancy; thus, it is recommended to use this method in prenatal care for these women.

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Introduction

Maternal-fetal attachment describes the relationship between mother and her fetus and is an emotion toward the unborn child, which starts from the beginning of pregnancy and reaches its peak during the second and third trimesters of pregnancy (1, 2). This feeling is influenced by maternal age, educational level, socioeconomic status, marital status, gestational age, parity, mothers mental imagine of herself, obstetric and medical problems during pregnancy, social support, maternal anxiety and psychiatric status, accepting the pregnancy, and unwanted pregnancy (3, 4).

Anxiety in pregnant women, especially in nulliparous women who are not ready for motherhood, reduces maternal-fetal attachment and mother's ability to assume maternal role (5). In a study by Ossa et al. (2011), maternal-fetal attachment was significantly higher in women with intended pregnancy compared to

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those with unintended pregnancy (6). In addition, in a study by Ustunsoz et al. (2010), the maternal-fetal attachment score was higher in planned pregnancies than unplanned ones (7). However, in a study by Torshizi et al. (2012) performed in Birjand, mean score of maternal-fetal attachment was not significantly different between wanted and unwanted pregnancies (8).

Maternal-fetal attachment plays an important role in accepting maternal role, child's growth and development, increasing tendency to breast-feeding (9), promoting mothers' confidence in playing maternal role, and causing the mother to show more compatibility with postpartum period and give positive response to infant's behaviors (4, 10). In addition, mothers with higher fetal attachment have stronger interaction with their infant (4). Mothers with weak attachment to their fetus reported high levels of anxiety and depression that can lead to adverse pregnancy outcomes (8).

The results obtained by Kelly (2001) revealed that maternal-fetal attachment is directly associated with health training (11). Belleini et al. (2007) in a study showed that training courses during pregnancy have a positive impact on maternal-fetal attachment (12). Ample studies have been performed so far in the field of maternal-fetal attachment including training of attachment behavior to fetus, touching the fetus, counting fetus's movements, and relaxation training (3, 4, 10, 13, 14).

Relaxation is a coping strategy for stress, and in behavioral and alternative therapies and simple medical treatments, relaxation and maternal-fetal attachment are practiced after a brief training program (10, 15, 16). There are various techniques for relaxation including guided imagery, hypnosis, massage, meditation, muscular progressive relaxation, and yoga (15). Some studies have shown that guided imagery leads to relaxation, reduced anxiety, and fetal attachment (16-19).

Guided imagery during pregnancy can improve the feeling of mothers toward their fetus and help them comply with their role (10). Deutsch et al. reported that women who imagine themselves as able mothers during pregnancy had more compliance with maternal role and were more competent in their maternal role during the postpartum period (20).

Guided imagery as a mind-body technique is based on the assumption that the mind and body are linked and reinforce each other(۲۱) . This method can be learned by an instructor or self-training books or tapes and can be used at times of pain or anxiety and mental stress (22). Zahourek (1988) suggests that guided imagery affects physiologic and psychological status and behaviors of a person, promotes health, reduces stress, and enhances positive feelings (19). Rogers (1983) believes that humans and environment are energy fields, which are continuously interacting, such that change in one leads to transformations in the other. Women form an attachment with fetus during pregnancy if their energy and environment are directed toward this goal. Attachment behavior is a symbol of human-environment interaction and is a process with energy context (23).

Maternal-fetal attachment, which is lower in unplanned pregnancies, is of great significance for desirable pregnancy outcomes. Guided imagery triggers formation of attachment behaviors (23); however, different psychological aspects of guided imagery have not been evaluated yet. Thus, this study was performed to determine the effect of guided imagery on maternal-fetal attachment in nulliparous women with unplanned pregnancy in Mashhad health centers.

Materials and Methods

This study is a clinical trial with a pretest-posttest design that was performed on 67 nulliparous women (35 in the intervention and 32 in the control groups) with unplanned pregnancy and gestational age of 33 weeks, who were referred to 10 health centers of Mashhad, Iran, during August-October 2014. Based on the results of a pilot study and the formula of comparison of means and 99% confidence coefficient and power of 90%, sample size was calculated to be 35 cases in each group.

In the control group, three cases (two due to failure to complete the questionnaire after delivery and one due to lack of desire to continue participating in the study) were excluded from the study. The inclusion criteria were nulliparous women, obtaining a score of 0-3 from London questionnaire, singleton pregnancy, gestational age of 33 weeks, and living with husband. The exclusion criteria were preterm labor, obstetric problems during

pregnancy, infertility history, and education in Medical Sciences and Psychology.

Data collection tools included personal-family information form, London questionnaire to assess unplanned pregnancy, depression, anxiety, and stress questionnaire (DASS 21), and Cranley's maternal-fetal attachment questionnaire. Support of husband and others (father, mother, sister, brother, relatives, friends, and colleagues) was assessed using two questions in the demographic form, such that the subjects selected a number from zero to 10 with 0 indicating lack of support, 5 showing average support, and 10 exhibiting complete support.

London questionnaire comprises of six questions investigating the use of contraceptive methods, timing of pregnancy, intention and desire for pregnancy, communication with the sexual partner, and preparation for pregnancy. All the questions are scored from zero to two with total scores ranging between zero and 12. The scores of 0-3 demonstrate unplanned pregnancy (24).

Cranley's questionnaire includes 24 items, which can be divided into five sub-groups of interacting with fetus, mother's differentiation between herself and fetus, accepting maternal role, attributing some characteristics to the fetus, and devotion. The questionnaire was rated using a 5-point Likert-type scale (certainly no [1], no [2], do not know [3], yes [4], and definitely yes [5]). The minimum and maximum scores were 24 and 120 with higher scores representing stronger attachment (4).

Dass 21 questionnaire comprises of 21 questions evaluating depression, anxiety, and stress. The scale is rated using a 4-point Likert scale with responses ranging from never to very high (zero to three). Scores of 6-8, 4-5, 6-5 exhibit mild depression, anxiety and stress, respectively, and scores of > 10, 14, 17 show severe depression, anxiety, and stress (25).

Content validity of the personal-family information form and London questionnaire was confirmed and reliabilities of London, Cranley's, and Dass 21 questionnaires were confirmed with alpha coefficients of 0.71, 0.76, and 0.90, respectively. The researcher adjusted the content of guided imagery in relation to maternal role with cooperation of a consultant; after the content was approved by the consultant, the participants were referred to the studio of recording audio and then recorded training CD of maternal role imagery. After final approval of the guided imagery CD by the consultant, it was given to the subjects. Social and economic levels of the subjects were determined with respect to their job and educational level.

After obtaining approval of the Ethics Committee of Mashhad University of Medical Sciences, sampling was performed through combined, stratified, cluster, and available sampling methods. Five health centers of Mashhad (health centers of No 1, 2, 3, Samen, and 5) were considered as one class (five classes in general). From the list of existing centers in that area, two centers were randomly selected as a cluster. Random selection was in a way that both names of two centers were written on two separate sheets and placed into a draw bag, the first selected sheet was assigned to the intervention group and second sheet to the control group. Given the number of classes, a total of 10 health centers were selected.

If nulliparous women who met the inclusion criteria had unplanned pregnancy, the researcher explained the aims of the study to them; London questionnaire was given to them and if they obtained a score of 0 to 3, other inclusion criteria were evaluated and if they met all the criteria to enter the study, informed consent form was completed by them. The researcher reminded the participants the appointment through phone calls on the day before the intervention. Then, in the 34th week of pregnancy, the participants in both groups completed the personal-family form and Cranley's and DASS 21 questionnaires.

The experimental group received one session of guided imagery regarding maternal role in 34th week of gestation in groups of four and seven. Guided imagery was taught through training classes for the mothers at health centers that had comfortable chairs and were sufficiently quiet. The techniques and the effects of guided imagery were taught to the subjects. Afterwards, the mothers were asked to take a few deep breaths, switch off their phones, and focus their attention on the CD of maternal role imagery and imagine their maternal role

throughout the mental imagery, which lasted for 20 minutes.

Thereafter, the researcher gave the guided imagery CDs to the mothers and they were asked to perform guided imagery at home twice a week during two weeks. The researcher followed the subjects through phone calls in terms of performing guided imagery. The control group only received the routine care. Finally, the participants completed the Cranley's questionnaire in the 36th week of pregnancy. Pre-test and post-test results were compared between the two groups.

To analyze the data, descriptive statistics (mean, standard deviation, median, interquartile range, frequency distribution) and independent t-test, paired t-test, Chi-squared, Fisher's exact test, and Mann-Whitney U tests were run using SPSS version 21. P-value less than 0.05 was considered statistically significant.

Results

The two groups were matched for age, husband and others' support, such that mean ages in the intervention and control groups were 24.0±4.6 and 24.19±4 years, respectively (P=0.88), mean scores of husband's support in the intervention and control groups were 8.23±1.6 and 8.06±2.6, respectively (P=0.46), and mean scores of others' support were 8.26±2.2 and 8.09±2.4 (P=0.93). Chi-squared and Fisher's exact tests showed that the two groups were similar in terms of maternal educational level (P=0.34), socio-economic class (P=0.70), occupation (P=0.37), history of abortion (P=0.70), status of marital satisfaction (P=0.29), and housing status (P=0.93) (Table 1).

Table 1. Distribution of the subjects regarding maternal educational level, socioeconomic status, occupation, history of abortion, level of marital satisfaction, and housing status in the intervention and control groups

Variable	Group		P-value
	Intervention	Control	
	N (%)	N (%)	
Maternal educational level			
Secondary school and less	4(11.4)	8(25)	
High school and diploma	19(54.3)	14(43.8)	0.34*
College and higher	12(34.3)	10(31.3)	
Socioeconomic status			
2	22(62.9)	22(68.8)	
3	7(20)	44(12.5)	0.71*
4	6(17.1)	6(18.8)	
Occupation			
Housewife	22(62.9)	19(59.4)	
Employed	13(37.1)	13(40.6)	0.37*
History of abortion			
None	32(91.4)	28(87.5)	0.70**
History of one abortion	3(8.6)	4(12.5)	
Marital satisfaction			
Good or Excellent	32(91.4)	26(81.3)	
Relatively good	3(8.6)	6(18.8)	0.29**
Housing status			
Rental	20(57.1)	17(53.1)	
Private	3(8.6)	3(9.4)	0.93*
Others	12(34.3)	12(37.5)	

* Chi-squared** test Fisher's exact

Considering the results of independent t-test, mean score of maternal-fetal attachment was similar in the two groups before training (P=0.966), while it was significantly different post-

intervention (P=0.046). Based on paired t-test results, in the intervention group, there was a significant difference in mean scores of maternal-fetal attachment before and after training (P<0.001), the difference was also significant in the control group (P=0.005). Independent t-test reflected that mean score of changes in maternal-fetal attachment was significantly higher in the intervention group than the controls (P=0.004; Table 2). Moreover, using covariance analysis and control of maternal-fetal attachment before the intervention, significant differences were observed between the two groups in terms of the effect of training on maternal-fetal attachment (P<0.001, t=16.14, B=94.61).

According to independent t-test results, mean depression score before training was similar in the two groups (P=0.744), but it was significantly different after the intervention (P=0.004). Based

Table 2. Mean score of maternal-fetal attachment before and after training during pregnancy in the intervention and control groups

Maternal-fetal attachment	Group				Independent t-test results
	Intervention		Control		
	Mean±SD	N	Mean±SD	N	
Before training	88.40±8.4	35	88.50±10.7	32	t=0.04 df=65 P=0.966
After training during pregnancy	94.26±6.7	35	90.22±9.5	32	t=-2.01 df=65 P=0.046
Changes in mean score before and after the intervention	5.86±7.2	35	1.72±3.2	32	t=-3.06, df=65, P=0.004
Paired t-test result	t=-4.79 df=34 P<0.001		t=-2.99 df=31 P= 0.005		

Table 3. Mean depression score before and after training during pregnancy in the intervention and control groups

Depression	Group				Independent t-test result
	Intervention		Control		
	Mean±SD	N	Mean±SD	N	
Before training	4.63±3.5	35	4.34±3.5	32	t=-0.328 df=65 P=0.744
After training during pregnancy	4±2.1	35	6.19±3.4	32	t=3.06 df=65 P=0.004
Paired t-test result	t=1.46 df=34 P=0.151		t=-6.11 df=31 P<0.001		

on paired t-test, in the intervention group, there was no statistically significant difference between the mean depression scores pre- and post-intervention (P=0.151); however, the difference was statistically significant in the control group (P<0.001; Table 3)

According to independent t-test, mean scores of stress before training were similar in the two groups (P=0.300), but the difference was statistically significant after training (P=0.002). Based on paired t-test results, in the intervention group, statistically significant differences were noted between stress scores before and after the intervention (P<0.001),

but the difference was not significant in the control group (P=0.88; Table 4).

Table 4. Mean score of stress before and after training during pregnancy in the intervention and control groups

Stress	Group				Independent t-test result
	Intervention		Control		
	Mean±SD	N	Mean±SD	N	
Before training	8.03±3.8	35	7±4.1	32	t=-1.04 df=65 P=0.300
After training during pregnancy	4.9±2.2	35	7.5±4	32	t=3.27 df=65 P=0.002
Paired t-test result	t=6.13 df=3 P<0.001		t=-1.76 df=31 P=0.088		

Table 5. Mean anxiety score before and after training during pregnancy in the intervention and control groups

Anxiety	Group				Independent t-test results
	Intervention		Control		
	Mean±SD	N	Mean±SD	N	
Before training	5.97±3.3	35	4.75±3.3	32	t=-1.48 df=65, P=0.142
After training during pregnancy	3.91±1.8	35	6.34±3	32	t=3.99 df=65, P<0.001
Paired t-test result	t=5.38 df=34 P<0.001		t=-6.01 df=31 P<0.001		

According to independent t-test results, mean anxiety score was similar in the two groups before training (P=0.143), but the difference was statistically significant after the intervention (P<0.001). Additionally, paired t-test showed a significant difference in mean anxiety score before and after training in the intervention group (P<0.001). The difference was statistically significant in the control group, as well (P<0.001; Table 5).

Discussion

The findings of this study exhibited that guided imagery promoted maternal-fetal attachment and perception of maternal role in nulliparous women with unplanned pregnancy. Prenatal care is an excellent opportunity to evaluate maternal-fetal attachment and to perform interventions for improving it (4).

A study by Kim (1990) on 58 pregnant couples in America revealed that guided imagery significantly increased father-fetal attachment, but caused no significant differences in the score of maternal-fetal attachment (16), which is not in line with our findings. In the study by Kim, the subjects were primiparous and multiparous women, who had gestational age of 30 weeks and attended childbirth classes and guided imagery, and their husbands. In that study, the training program included relaxation and attachment behaviors practice for 12 minutes, which was held once a week for four weeks.

The study of Phanthufak (2009) in Thailand showed that maternal role-promoting program for primiparous women enhanced maternal-fetal and maternal-neonatal attachment (26) that was consistent with our findings. In the study by Phanthufak, maternal role-promoting program, which included two training sessions

during pregnancy, one session after delivery, and six sessions of telephone counseling after delivery. The program comprised of practicing interaction with neonate through touch and massage in 36th and 37th weeks of pregnancy; post-test was performed in the sixth postpartum week.

The study of Akbarzadeh et al. (2011) in Shiraz showed that training of maternal-fetal attachment behaviors in the third trimester of pregnancy for primiparous women improved maternal-fetal attachment (13) that was consistent with the results of the current study. In the study of Akbarzadeh, all the subjects had planned pregnancy and training course included four 90-minute sessions of maternal-fetal attachment behaviors. The mean score of maternal-fetal attachment in the study of Akbarzadeh was lower than that of the present study, showing that maternal-fetal attachment in the subjects of that study was lower than maternal-fetal attachment in this study, this difference can be attributed to difference in type of pregnancy.

Abbasi et al. (2010) evaluated the effect of fetal movement counting by mother on maternal-fetal attachment in primiparous women and concluded that fetal movement counting ameliorates maternal-fetal attachment (3). The results of Abbasi's study were consistent with the outcomes of this study. In the study of Abbasi, the majority of subjects had planned pregnancy and training, which included only fetal movement counting, was performed in the 32th week of gestation.

Khoramrodi et al. (1999) in a study that investigated the effect of touch on maternal-fetal and neonatal attachment behaviors in primiparous women referred to health care centers in Bushehr concluded that two weeks of touching fetus was not effective in maternal-fetal attachment, but was effective in maternal-neonatal attachment (14), which was inconsistent with the current results. One of the differences of Khoramrodi's study with present work can be the subjects and training content. The benefit of Khoramrodi's study is their single-blind design.

Abbasi et al. (2010) evaluated the effect of training attachment behaviors on maternal-fetal attachment in primiparous women in Sari and found that four sessions of training attachment behaviors during one month significantly increased maternal-fetal attachment (4). Toosi et al. (2012) carried out a clinical trial to compare the effect of training attachment behaviors and relaxation on maternal-fetal and maternal-neonatal attachment in primiparous women and noted that training attachment behaviors and relaxation can strengthen maternal-fetal and maternal-neonatal attachment (10), which is consistent with this study. In the study by Toosi, post-test was performed one month after the start of training, and training included four 90-minute sessions. The mean score of maternal-fetal attachment in the study by Toosi was less than that obtained in the present study.

In the study of Akbarzadeh et al. (2011), training attachment behaviors and relaxation diminished personal and situational anxiety in primiparous women in the third trimester of pregnancy (13), which was consistent with our results. One of the inclusion criteria for this study was wanted pregnancy, and the Spielberger questionnaire was applied to assess anxiety. Training was presented in four sessions during the third trimester of pregnancy. In the study of Akbarzadeh et al. (2012), training attachment behaviors and relaxation lowered anxiety in primiparous women in the third trimester of pregnancy (9) that was consistent with this study. In the study by Akbarzadeh, all subjects had wanted pregnancy and the Spielberger questionnaire was used to evaluate anxiety. In a study by Bazrafshan et al. (2010), backstroke massage reduced anxiety in primiparous women (5) that was congruent with our outcomes. In the study of Bazrafshan, the Spielberger questionnaire was applied to assess anxiety, and massage was performed in the third trimester of pregnancy.

In a study by Seyed Ahmadi Nejad et al. (2014), progressive muscle relaxation decreased anxiety, depression, and stress in primiparous women (27) that was in line with this study. In a study by Seyed Ahmadi Nejad, DASS 21 questionnaire was employed and 14.7% of pregnant women had wanted pregnancy and 11.5% mistimed pregnancy, while in this study, all the subjects had unplanned pregnancy (unwanted and mistimed).

Delaram et al. (2011) proposed that consultation during the third trimester of pregnancy reduced anxiety in primiparous women (28),

which was consistent with this study. In the study of Delaram, Hamilton questionnaire was used to assess anxiety.

Malekpour-Afshar et al. (2005) showed that training on labor preparation results in an overall reduction of anxiety in primiparous women (29), which is in agreement with this study. In their study, Cattell test was used to assess anxiety. In the study by Toosi et al. (2011), attachment behavior training reduced anxiety and elevated maternal-neonatal attachment in primiparous women (2), which was consistent with this study. In the study of Toosi, all the subjects had wanted pregnancy and Spielberger questionnaire was employed.

One of the limitations of this study was that although the participants were homogenous in terms of social and economic status and other demographic factors to minimize individual differences and important stressful events were accounted for, daily stressful events were not considered. One of the strengths of this study was sampling in five health centers in Mashhad with different socio-economic classes.

Conclusion

In this study, guided imagery training enhanced maternal-fetal attachment; thus, it is recommended to consider guided imagery training during prenatal care, especially for women with unplanned pregnancy.

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Conflicts of interest

The authors declare no conflicts of interest.

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